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| 09/673,270 | 11/29/2000 | Ernst Eberlein | 41001 | 3590 |

7590 08/10/2005

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EXAMINER

WARE, CICELY Q

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| ART UNIT | PAPER NUMBER |
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2634

DATE MAILED: 08/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/673,270

Applicant(s)

EBERLEIN ET AL

Examiner

Cicely Ware

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 April 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 32 is/are allowed.
- 6) ☒ Claim(s) 19,20,22-31,33 and 34 is/are rejected.
- 7) ☒ Claim(s) 21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 4/26/2005 have been fully considered but they are not persuasive. Applicant asserts on Pg. 8 of REMARKS that Gledhill et al. discloses OFDM signals differentially coded in the direction of the time axis. However Examiner asserts that in Table 1 Gledhill et al. in fact discloses the signals differentially coded in the frequency domain.. Therefore examiner maintains the original rejection.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 19, 20, 22-31, 33, 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Gledhill et al. (previously cited).

(1) With regard to claim 19, Gledhill et al. discloses in (Fig. 1A, 1B) a method performing a fine frequency synchronization compensating for a carrier frequency deviation from an oscillator frequency in a multi-carrier demodulation system of the type capable of carrying out a differential phase decoding of multi-carrier modulated signals, said signals comprising a plurality of symbols, each symbol being differentially coded in the direction of the frequency axis (Table 1), said method comprising the steps of:

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determining a phase difference between phases of the same carrier in different symbols, determining a frequency offset by eliminating phase shift uncertainties related to the transmitted information from said phase difference making use of a decision device; performing a feedback correction (Fig. 4) of said carrier frequency deviation based on said determined frequency offset (abstract, col. 1, lines 21-26, col. 2, lines 30-39, 41-43, col. 3, lines 2-5, col. 4, lines 30-46, col. 5, lines 1-9, 16-22, 30-41, col. 6, lines 43-46, 54-56, 62-64, col. 8, lines 53-62, col. 9, lines, 59-63, col. 12, lines 51-55, col. 15, lines 3-18).

(2) With regard to claim 20, claim 20 inherits all the limitations of claim 19.

Gledhill et al. further discloses determining respective phase of the same carrier in different symbols; eliminating phase shift uncertainties related to the transmitted information from said phases to determine respective phase deviations making use of a decision device; determining frequency offset by determining a phase difference between said phase deviations (abstract, col. 3, lines 47-59, col. 9, lines 26-30, 59-63, col. 11, lines 3-20, 41-48, col. 12, lines 51-55).

(3) With regard to claim 22, claim 22 inherits all the limitations of claim 20.

Gledhill et al. further discloses wherein steps a, b and c are performed for a plurality of carriers in said symbols, an averaged frequency offset is determined by averaging said determined frequency offsets of said plurality of carriers, and said feedback correction of said frequency deviation is performed based on said averaged frequency offset (col. 4, lines 64-68, col. 8, lines 15-32, col. 9, lines 58-63).

(4) With regard to claim 23, claim 23 inherits all the limitations of claim 19.

Gledhill et al. further discloses the step of determining a phase difference between phases of the same carrier in symbols, which are adjacent in the time axis direction (col. 10, lines 33-34, 54-56, col. 11, lines 3-6).

(5) With regard to claim 24, claim 24 inherits all the limitations of claim 19.

Gledhill et al. further discloses the step of eliminating phase shift uncertainties corresponding to M-ary phase shifts (col. 2, lines 51-68, col. 3, lines 1-5, col. 4, lines 30-36).

(6) With regard to claim 25, claim 25 inherits all the limitations of claim 20.

Gledhill et al. further discloses the step of determining respective phases of the same carrier in symbols, which are adjacent in the time axis direction (col. 3, lines 47-49, col. 8, lines 1-5, col. 10, lines 33-34, 54-56, col. 11, lines 3-6).

(7) With regard to claim 26, claim 26 inherits all the limitations of claim 20.

Gledhill et al. further discloses the step of eliminating M-ary phase shifts (col. 2, lines 51-68, 1-5, col. 4, lines 30-46).

(8) With regard to claim 27, claim 27 inherits all the limitations of claim 19.

(9) With regard to claim 28, claim 28 inherits all the limitations of claim 20.

(10) With regard to claim 29, claim 29 inherits all the limitations of claims 27 and 22.

(11) With regard to claim 30, claim 30 inherits all the limitations of claims 28 and 22.

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(12) With regard to claim 31, claim 31 inherits all the limitations of claim 27 and 23.

(13) With regard to claim 33, claim 33 inherits all the limitations of claim 27. Gledhill et al. further discloses in (Fig. 4 (4, 7) wherein said means for performing a feedback correction of said frequency deviation comprises a numerical controlled oscillator and complex multiplier (col. 7, lines 58-68).

(14) With regard to claim 34, claim 34 inherits all the limitations of claim 33. Gledhill et al. further discloses in (Fig. 4 (2, 7) wherein said means for performing a feedback correction of said frequency deviation further comprises a low path filter preceding said controlled oscillator (col. 7, lines 58-68).

Allowable Subject Matter

4. Claim 21 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: The instant application discloses a method of performing a fine frequency synchronization compensating for a carrier frequency deviation from an oscillator frequency in a multi-carrier demodulation system. Prior art references show similar methods but fail to teach: **“an averaged frequency offset is determined by averaging said determined frequency offsets of said plurality of carriers, and said feedback correction of said frequency deviation is performed based on said averaged frequency offset”**, as in claim 21

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5. Claim 32 is allowed.
6. The following is a statement of reasons for the indication of allowable subject matter: The instant application discloses a method of performing a fine frequency synchronization compensating for a carrier frequency deviation from an oscillator frequency in a multi-carrier demodulation system. Prior art references show similar methods but fail to teach: **“means for determining respective phases comprises means for determining respective phases of the same carrier in symbols which are adjacent in the time axis direction”**, as in claim 32.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cicely Ware whose telephone number is 703-305-8326.


The examiner can normally be reached on Monday – Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Cicely Ware

cqw
August 6, 2005



STEPHEN CHIN
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